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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/529,302	03/25/2005	Alan Richard Malvern	038665.56082US	4772

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EXAMINER

KWOK, HELEN C

ART UNIT PAPER NUMBER

2856

DATE MAILED: 11/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/529,302	Applicant(s) MALVERN, ALAN RICHARD	
	Examiner Helen C. Kwok	Art Unit 2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>March 25, 2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

2. The drawings are objected. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Figures 1 and 2, should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

In Figures 12 and 13, the block elements should be labeled with its description.

Specification

3. The disclosure is objected to because of the following informalities. Appropriate correction is required.

The specification lacks the appropriate headings. See MPEP 608.01(a).

Claim Objections

4. Claims 1-18 are objected to because of the following informalities. Appropriate correction is required.

In claim 1, line 12, the word – the – should be inserted before the word “inner”.
In line 16, the word – the – should be inserted before the words “inner”, “proof” and “mounting”.

In claim 6, line 5, the word – the – should be inserted before the words “proof”, “mounting” and inner”.

In claim 10, line 2, the word – the – should be inserted before the words “mounting”, “inner” and “interdigitated”.

In claim 14, line 2, the word – the – should be inserted before the word “first”. In line 2, the word – the – should be inserted before the words “proof” and “inner”. In line 3, the word – the – should be inserted before the word “fifth”.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, line 20, the phrase "the flexible suspension" lacks antecedent basis.

In claim 9, line 2, the phrase "the first and third offset arrays of fingers" lacks antecedent basis. In lines 3-4, the phrase "the second and fourth offset arrays of fingers" lacks antecedent basis. In line 11, the phrase "the first and second offset arrays" lacks antecedent basis. Furthermore, it appears the equation is missing in the claim. Please correct.

In claim 11, lines 3-4, the phrase "said mounts" lacks antecedent basis.

In claim 17, lines 5-6, the phrase "the first and third offset arrays of fingers" lacks antecedent basis. In line 6, the phrase "the second and fourth offset arrays of fingers" lacks antecedent basis.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 98/52051 (Laermer et al) in view of U.S. Patent Publication 2001/0047688 (Woodruff et al.) and U.S. Patent 5,447,067 (Biebl et al.) and U.S. Patent Publication 2004/0025589 (Kurle et al.) and U.S. Patent 5,559,290 (Suzuki et al.) and EP 338,688 (Suzuki et al.) and U.S. Patent Publication 2001/0032508 (Lemkin et al.) and U.S. Patent 5,559,290 (Suzuki et al.).

Laermer et al. discloses an acceleration sensor comprising, as illustrated in Figures 1-3, a plate-like base made from an electrically non-conductive material; an outer substantially planar support frame 24 fixedly bounded to the base; an inner substantially planar, ring-like, support frame 16 flexibly suspended within the outer support frame by mounts 22 connecting the inner support to the outer support frame so that the inner support frame is spaced from the base and co-planar with the outer support frame; a substantially planar plate-like proof mass 14 moveably mounted in the inner support frame; four flexible mounting legs 20 co-planar with the proof mass and inner support frame wherein each mounting leg is connected at one end to the proof mass and connected to another end of the inner support frame so that the proof mass is mounted for linear movement in a sensing direction 46 in the plane containing the outer support frame, inner support frame, proof mass, and mounting legs in response to acceleration such that the mounting legs extends substantially perpendicularly to the sensing direction and the flexible suspension of the inner support frame reduces

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compressive and tensile forces on the mounting legs as a function of temperature. (See, page 2, line 21 to page 12, line 2). The only difference between the prior art and the claimed invention is the outer support frame is ring-like shaped. Woodruff et al. discloses an accelerometer comprising, as illustrated in Figures 1-12, an outer support frame having a ring-like shaped. (See, sections [0011],[0012],[0017],[0035]). It would have been obvious to a person of ordinary skills in the art at the time of invention to have readily recognize the advantages and desirability to fabricate the outer support frame to have a ring-like shaped as suggested by Woodruff et al. to the accelerometer of Laermer et al. since this can be regarded as to facilitate the manufacturing of the accelerometer and is would be much easier to manufacture a ring-like shaped structure that the support beams 24 of Laermer et al. because of the reduced amount of material to be etched.

With regards to claims 2-3, Biebl et al. discloses an acceleration sensor comprising, as illustrated in Figures 1-4, the outer support frame is anodically bonded to the base made of glass. (See, column 5, lines 25-39). It would have been obvious to an artisan in the art to readily recognize the advantages and desirability of fabricating the sensor by anodically bonded to a glass base as taught by Biebl et al. to the apparatus of Laermer et al. to provide a sensor with high precision with high long-term stability are ensured. (See, column 5, lines 66-68 of Biebl et al.).

With regards to claims 4-5, Kurle et al. discloses a sensor comprising, as illustrated in Figures 1-5, a plate-like cap made of non-conductive material (i.e. glass) is anodically bonded to the outer support frame. (See, sections [0011],[0013],0015)). It

would have been obvious to a person of ordinary skills in the art at the time of invention to have readily recognize the advantages and desirability of employing a plate-like cap made of non-conductive material (i.e. glass) is anodically bonded to the outer support frame as suggested by Kurle et al. to the sensor of Laermer et al. to reduce the deflection of the movable element. (See, sections [0002],[0003]).

With regards to claims 6-8, Laermer et al. further discloses a plurality of interdigitated capacitor fingers in a gaseous medium (i.e. air). (As observed in the figures).

With regards to claim 9, Suzuki et al. discloses a first and a second drive voltage with pulse width modulation. (See, page 3, lines 15-28). It is well known in the art to an artisan to provide a first and a second drive voltage with pulse width modulation to the sensor of Laermer et al. to provide an accelerometer that does not need a non-linearity compensation circuit. (See, page 3, lines 6-40 of Suzuki et al.).

With regards to claims 10 and 14, Biebl et al. further discloses the claimed elements are dry etched and anodically bonded. (See, column 3, lines 60-62; column 5, lines 32-35).

With regards to claims 12-13, Laermer et al. further discloses the claimed arrangement of the sensor. (See, page 4, lines 20-23; page 8, lines 4-10).

With regards to claims 15-16, Lemkin et al. discloses an accelerometer comprising, as illustrated in Figure 4, at least four earth screens. (See, section [0035]). It would have been obvious to an artisan to employ the four earth screens as suggested

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by Lemkin et al. to the sensor of Laermer et al. to prevent a large, constant parasitic capacitance in parallel with the sense-capacitor. (See, section [0035]).

With regards to claim 17, Suzuki et al. discloses an accelerometer comprising, as illustrated in Figure 32, the claimed features as presently claimed. (See, column 11, lines 8-33). It would have been obvious to employ the circuitry arrangement as taught by Suzuki et al. to the sensor of Laermer et al. to create an easily and reliably connection between the detection unit and the exterior without creating any problems in package of the electrode lead. (See, column 11, lines 46-52).

With regards to claims 11 and 18, the claimed subject matter only suggest changes which are regarded as being within the scope of the customary practice followed by persons skilled in the art, especially as the advantages thus achieved can be readily contemplated in advance.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

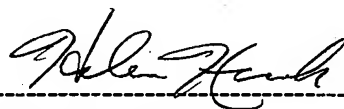
The references cited are related to acceleration sensor with support frames.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helen C. Kwok whose telephone number is (571) 272-2197. The examiner can normally be reached on 8:30 to 5:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron E. Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Helen C. Kwok
Art Unit 2856

hck
November 24, 2006